ABSTRACT OF THE DISCLOSURE

The present invention teaches methods of operating a pressurized cryogenic liquid gas storage tank that has a vent cooling shield around which fuel vented from a storage tank flows to cool the storage tank by reducing the influence of heat influx into the storage tank. The method of the present invention provides for reduction in the quantity of fuel loss during the venting operation and allows a greater volume of liquid fuel to be stored in the storage tank. The method includes allowing fuel in a storage tank to transition between a two-phase state of liquid and gas into a single-phase state of liquid and back into a two-phase state of liquid and gas. Additionally, the present invention allows filling a storage tank to a liquid level greater than about 95% of the capacity of the storage tank.